

UPAYA PENINGKATAN EFEKTIVITAS MESIN PADA PROSES PRODUKSI DI PT MEGA JAYA LOGAM MENGGUNAKAN METODE *OVERALL EQUIPMENT EFFECTIVENESS*

Mey Surya Nengsih, Suseno

Program Studi Teknik Industri, Universitas Teknologi Yogyakarta, Jl. Glagahsari
No.63 Warungboto, Umbulharjo, Yogyakarta City, Special Region Of
Yogyakarta.

Email: meyhutasoit01@gmail.com

ABSTRAK

PT Mega Jaya Logam merupakan perusahaan yang bergerak di bidang pengecoran logam yang memproduksi beberapa logam seperti *manhole*. Perusahaan ini selalu mengutamakan kualitas produk dengan memperhatikan produktivitas produk untuk menjaga kepercayaan *buyer*, oleh sebab itu perusahaan ini maju cukup pesat. Dalam pembuatan produk *manhole*, terdapat beberapa kerusakan pada tanur induksi membuat waktu produktif jadi terganggu akibat terjadinya *downtime*. Pada bulan Januari 2023 terjadi kerusakan pada tanur induksi yang menyebabkan *downtime* selama 240 menit atau 4 jam membuat produksi berjalan tidak optimal. Hal itu dapat menimbulkan *waste time*, bahkan kerusakan yang sering dialami mesin akan mengganggu kualitas produk. Untuk mengurangi terjadinya *downtime* maka perlu dilakukan penerapan *Total Productive Maintenance* (TPM) dengan memanfaatkan perhitungan *Overall Equipment Effectiveness* (OEE) dan menghitung kerugian utama yang timbul menggunakan metode *Six Big Losses*. Setelah itu mengidentifikasi penyebab menurunnya efektivitas tanur induksi dengan diagram sebab akibat dan upaya perbaikan menggunakan 5W+1H. Diketahui nilai OEE yang didapat berdasarkan persentase efektivitas tanur induksi sebesar $67,36\% < 85$ standar JIPM. OEE juga melakukan pengukuran tiga rasio utama di mana *availability ratio* yang didapat $95,69\%$, *performance ratio* sebesar $75,47\%$, dan *quality ratio* sebesar $92,89\%$. Kerugian berdasarkan rendahnya OEE dihitung menggunakan *six big losses* dengan persentase kerugian tertinggi pada *reduced speed losses* mencapai $23,49\%$. Berdasarkan diagram sebab akibat, beberapa faktor penyebab menurunnya efektivitas mesin yaitu pasir silika menipis, tungku retak, penyanggah patah, dan pipa pendingin tersumbat. Oleh sebab itu, dilakukan upaya perbaikan berdasarkan faktor dan penyebab permasalahan menggunakan metode 5W+1H.

Kata Kunci: *Downtime*, OEE, *Six Big Losses*, Efektivitas

EFFORTS TO INCREASE MACHINE EFFECTIVENESS IN THE PRODUCTION PROCESS AT PT MEGA JAYA LOGAM USING THE OVERALL EQUIPMENT EFFECTIVENESS METHOD

Mey Surya Nengsih, Suseno

Industrial Engineering Study Program, University of Technology Yogyakarta, Jl. Glagahsari No.63 Warungboto, Umbulharjo, Yogyakarta City, Special Region Of Yogyakarta.

Email: meyhutasoit01@gmail.com

ABSTRACT

PT Mega Jaya Logam is a company engaged in the metal casting sector which produces several metals such as manholes. This company always prioritizes product quality by paying attention to product productivity to maintain buyer confidence, therefore this company is progressing quite rapidly. In the manufacture of manhole products, there are several defects in the induction furnace that disrupt productive time due to downtime. In January 2023 there was damage to the induction furnace which caused downtime of 240 minutes or 4 hours making production not optimal. This can cause waste time, even damage that is often experienced by the machine will interfere with product quality. To reduce downtime, it is necessary to apply Total Productive Maintenance (TPM) by utilizing the Overall Equipment Effectiveness (OEE) calculation and calculating the main losses that arise using the Six Big Losses method. After that identify the cause of the decreased effectiveness of the induction furnace with a cause and effect diagram and improvement efforts using 5W+1H. It is known that the OEE value obtained based on the percentage of effectiveness of the induction furnace is 67.36% < 85 JIPM standard. OEE also measures three main ratios where the availability ratio is 95.69%, the performance ratio is 75.47%, and the quality ratio is 92.89%. Losses based on low OEE are calculated using six big losses with the highest percentage of losses at reduced speed losses reaching 23.49%. Based on the cause and effect diagram, several factors causing the decrease in engine effectiveness are thinned silica sand, cracked furnace, broken supports, and clogged cooling pipes. Therefore, improvement efforts are made based on the factors and causes of the problem using the 5W+1H method.

Keywords: Downtime, OEE, Six Big Losses, Effectiveness

DAFTAR PUSTAKA

- Adhimursandi, D., Haribowo, R., & Novianti, R. (2022). Analysis of the Application of Total Productive Maintenance as a Support for Productivity by Measuring the Overall Equipment Effectiveness at PT Sumalindo Lestari Jaya Global TBK. *International Journal of Multicultural and Multireligious Understanding*, 9(6), 436-444.
- Adhiwikarta, J., Haryanto, E., & Hermawan, S. (2022). Analisis Kinerja Mesin CNC Wire Cutfanuc Robocuta C400ib Dengan Metode Overall Equipment Effectiveness (OEE) Pada PT. XYZ. *Sisprotek*, 1(1), 32-42.
- Ahdiyati, T., & Nugroho, Y. A. (2022). Analisis Kinerja Mesin Bandsaw Menggunakan Metode Overall Equipment Effectiveness (Oee) Dan Six Big Losses Pada Pt Quartindo Sejati Furnitama. *Jurnal Cakrawala Ilmiah*, 2(1), 221-234.
- Edward, J. G. (2021). Implementation of Total Productive Maintenance with Overall Equipment Effectiveness (Oee) Method to Determine Maintenance Strategy for Digester Plant Machines (Case Study of PT. Toba Pulp Lestari, Tbk). *International Journal of Mechanical Computational and Manufacturing Research*, 101-110.
- Fuadiya, S. L., & Widjajati, E. P. (2022). Analysis of sag mill machine performance using overall equipment effectiveness and failure model and effects analysis method. *International Journal of Industrial Optimization*, 3(2), 141-153.
- Karmilawati, E. K., Mulyono, K. M., & Nugroho, S. N. (2021). Pendekatan OEE (Overall Equipment Effectiveness) Untuk Mengurangi Losses Pada Mesin Moulding Cerex. *Jurnal Optimasi Teknik Industri (JOTI)*, 3(2), 46-48.
- Kingsley, O. O., Isaac, O. E., & Nkoi, B. Improving Management Systems for Oil and Gas Producing Company using Overall Equipment Effectiveness. *International Journal of Engineering and Modern Technology (IJEMT) E-ISSN 2504-8848*.
- Lumbantoruan, I. S. (2021). Pengukuran Tingkat Efektivitas Mesin Milling di PT Nok Freudenberg Batam. *Computer and Science Industrial Engineering (COMASIE)*, 4(6), 52-61.
- Marfinov, B. F. P. A., & Pratama, A. J. (2020). Overall Equipment Effectiveness (OEE) analysis to minimize six big losses in continuous blanking machine. *IJIEM- Indonesian Journal of Industrial Engineering and Management*, 1(1), 25.
- Mulyati, F. S., Septiadi, M. T., & Fauzi, M. (2022). Analisis Penerapan Total Productive Maintenance (TPM) Dengan Menggunakan Metode Overall Equipment Effectiveness (OEE) di PT XYZ. *Jurnal Bayesian: Jurnal Ilmiah Statistika dan Ekonometrika*, 2(1), 75-81.
- Nurdin, F. F. (2023). Peningkatan Produktivitas Peralatan dan Perawatan Mesin Total Productive Maintenance (TPM) menggunakan metode Overall Equipment Effectiveness (OEE). *Prosiding Sains dan Teknologi*, 2(1), 388-399.

- Purbasari, A., & Salim, A. (2021). Penilaian Efektivitas Pada Mesin Daich Dengan Metode Overall Equipment Effectiveness (OEE) di PT UB. *PROFISIENSI: Jurnal Program Studi Teknik Industri*, 9(2), 271-280.
- Putra, H. R. (2020). Analisis Maintenance Mesin Dalam Menunjang Kelancaran Produksi Pada PT. Sumber Sawit Sejahtera (Doctoral dissertation, Universitas Islam Riau).
- Saputro, I., Rimawan, E., Sabaruddin, A., & Abadi, W. (2020). Performance Measurement Analysis of Injection Molding Machine JSW J450AD Using Methods Overall Effectiveness (OEE) And Failure Mode Effect Analysis (FMEA) In The Plastics Industry. *International Journal of Innovative Science and Research Technology*.
- Siregar, K., & Rizkiansyah, H. (2022, December). Analisis efektivitas mesin ripple mill menggunakan metode overall equipment effectiveness (OEE). In *Talenta Conference Series: Energy and Engineering (EE)* (Vol. 5, No. 2, pp. 129-135).
- Sunadi, S., Purba, H. H., & Paulina, E. (2021). Overall Equipment Effectiveness to Increase Productivity of Injection Molding Machine: A Case Study in Plastic Manufacturing Industry. *ComTech: Computer, Mathematics and Engineering Applications*, 12(1), 53-64.
- Tammya, E., & Herwanto, D. (2021). Analisis Efektivitas Mesin Debarker Dengan Menggunakan Metode Overall Equipment Effectiveness (OEE) Di PT. XYZ Kuningan, Jawa Barat. *SITEKIN: Jurnal Sains, Teknologi dan Industri*, 19(1), 20-27.
- Wardani, I. K., Atmaji, F. T. D., & Alhilman, J. (2021). Pengukuran dan analisa efektivitas mesin pencetak paving menggunakan metode overall equipment effectiveness (OEE). *Journal Industrial Servicess*, 7(1), 125-132.
- Wibisono, D. (2021). Analisis Overall Equipment Effectiveness (OEE) Dalam Meminimalisasi Six Big Losses Pada Mesin Bubut (Studi Kasus di Pabrik Parts PT XYZ). *Jurnal Optimasi Teknik Industri (JOTI)*, 3(1).
- Zubair, M., Maqsood, S., Habib, T., Usman Jan, Q. M., Nadir, U., Waseem, M., & Yaseen, Q. M. (2021). Manufacturing productivity analysis by applying overall equipment effectiveness metric in a pharmaceutical industry. *Cogent Engineering*, 8(1), 1953681.
- Zulfikar, M. R., Rizqullah, A. N., Pratama, E. S., Febrianti, S., Al Azhar, F., & Anwar, A. (2022). Analysis of Total Productive Maintenance (TPM) Using Overall Equipment Effectiveness (OEE) Approach on Cartoner Machine at PT. ABC. *ITALIENISCH*, 12(2), 459-46.